In the Specification

Page 2, lines 27-33:-

In our co-pending application serial number 09/190,081 ~~09/xxxx~~ ~~(11862IDMauger)~~, the use of a, the use of a two-layer MPLS network in order to simplify the management of Virtual Public/Private Networks (VPN) is described. In the present application, the use of a four-label stack provides connection oriented behaviour for voice traffic whilst retaining strict edge control analogous to standard IP network operation. The use of a three layer, five stage hierarchical network of routers enables the technique to be employed over an international or global network.

Page 8, line 13 to page 9, line 36:-

An exemplary five-stage virtual private network (VPN) with four-layer label control is illustrated in figure 6. The network comprises a hierarchical or layered structure of local tandem routers 61a, national tandem routers 61b and tandem routers 61c. A super-ordinate manager 60 is responsible for configuring one or more virtual private networks within the network structure of figure 6. This VPN configuration is performed by defining the Layer 1 LSPs (label switched paths) in terms of service level agreements and constraints for their routing through the network. This information is formulated as a COPS (Common Open Policy Service) command which is pushed down to the label switch router (LSR) 61a which forms the ingress of the requested CR-LSP. The super-ordinate manager 60 also pushes the COPS commands to an admission manager (AM) 64 within media gateway controller 65, which admission manager records resources available for use in service requests, the admission manager 64 then pushes the COPS messages down to the label switched routers (LSRs) 61a, 61b, 61c, where they are used to invoke RSVP-TE or CR-LDP sessions in order to

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establish the virtual private network (VPN). The super-ordinate manager 60 then establishes a mesh of DM-LSPs (dynamic multiplex label switched paths) 66 between all of the local label switch routers 61b and all of the national tandem label switch routers 61c. This mesh establishes a network in which a constraint-based routed label switched path (CR-LSP) between any two local label switch routers can be specified by a pair of DM-LSPs (dynamic multiplex label switched paths). For a full mesh configuration, there are as many alternative routes between each pair of local label switch routers as there are national tandem label switch routers deployed in the network. After the super-ordinate manager 60 has configured the core network, the admission manager 64 configures a set of label switched paths between the media gateway 67 coupled to user terminal 68 and the local LSR node 61a. When a media gateway controller 65 wishes to establish a session with QoS guarantees it requests its associated admission manager 64. A session request may be initiated directly by a session control protocol such as Q1901 or SIP, or it may be initiated as a result of intercepting an RSVP message. Communication between the media gateway controllers advantageously uses a protocol which is able to tunnel connection control information such as Q1901, SIP or RSVP. The connection control information which is tunnelled between media gateway controllers is a list of label switched path identifiers (LSP-Ids). In the forward direction this information comprises a list of candidate dynamic multiplex label switched paths (DM-LSPs) which are suitable to access a national tandem together with an LSP-ID (label switched path identifier) for the media gateway (MG) to local LSR connection. In the reverse direction the control information comprises a list of the four LSP-IDs selected to form the end-to-end connection. I.e. MG-Local LSR, Local LSR-National Tandem LSR, National Tandem LSR-Local LSR, Local LSR-MG. The scheme may be operated separately for each direction of transport or bi-directional operation could be chosen. The five-stage network of figure 6 accommodates long distance or global traffic; fewer stages would be required for local services. On receipt of the list of the four LSP-IDs defining an end-to-end connection, the admission manager 64 uses COPS to push the list down to the

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local node 61a 51a for routing to the far-end media gateway 67a. The Local LSR response is to push four labels on to all packets received from the label switched path (LSP) identified as the connection from the local media gateway and then to forward the labelled packets. The media gateway may use labels internally, in which case the payload from the perspective of the Local LSR 61a will contain labels of significance only to the two media gateways involved. The first two labels are the two associated with the dynamic multiplex--LSP to the national tandem router 61b, which labels were allocated when the virtual private network was configured, and are stored in the local LSR 51a as related to its LSP-ID. The next two labels receive special treatment. An LSP-ID is intended for use as a network wide significant identifier for use in management systems as well as in LSRs. This LSP-ID comprises the IP Address of the ingress node of the CR-LSP as well as a sixteen bit locally significant identifier within that node. This locally significant identifier is sufficient to identify the DM-LSP from the National Tandem LSR 61b to the destination Local LSR 61a and from the Local LSR to the media gateway. These LSP-ID local identifiers are therefore used as the third and fourth labels and are treated as indirect addresses at the national tandem and local LSRs respectively.